

CLAIMS

What is claimed is:

1 1. A method for receiving information over a power
2 line, comprising:
3 separating data within a payload of an incoming frame
4 into a plurality of blocks; and
5 processing both frame control symbols and data within the
6 blocks by Frame Control Forward Error Correction (FEC)
7 decoding logic.

1 2. The method of claim 1 further comprising separating
2 data bits recovered from each block for transmission over at
3 least two different communication paths.

1 3. The method of claim 1, wherein each of the plurality
2 of blocks being equal in length.

1 4. The method of claim 1, wherein the separating of the
2 data comprises:
3 separating the payload into at least two physical
4 transmission blocks; and
5 separating each of the at least two physical transmission
6 blocks into the plurality of blocks, each block having a
7 length less than one-half a length of the physical
8 transmission block.

1 5. The method of claim 4, where the length of each
2 physical transmission block being approximately forty symbols.

1 6. The method of claim 5, wherein the length of each
2 block being approximately four symbols.

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1 7. The method of claim 6, wherein the four symbols of
2 each block carry a plurality of input bits.

1 8. The method of claim 1, wherein the processing of
2 both the frame control symbols and data of the payload
3 includes de-interleaving and decoding operations.

1 9. The method of claim 8, prior to conducting at least
2 one of the de-interleaving and decoding operations on the
3 data, the method further comprises:

4 recovering at least one bit from one of the frame control
5 symbols to detect whether the frame is being transmitted in
6 accordance with a low-rate automation control (LORA) mode.

1 10. A method comprising:

2 determining whether a HomePlug compliant station is
3 operating in a low-rate automation control (LORA) mode;

4 encoding both control information and data within a Frame
5 Control Forward Error Correction (FEC) encoding logic if the
6 HomePlug compliant station is operating in the LORA mode.

1 11. The method of claim 10 further comprising:

2 upon determining that the HomePlug compliant station is
3 not operating in the LORA mode,

4 producing frame control symbols for a frame by the
5 Frame Control FEC encoding logic, and

6 producing data corresponding to a payload of the
7 frame by a Data FEC encoding logic.

1 12. The method of claim 10, wherein the determination
2 whether the HomePlug compliant station is operating in the
3 LORA mode comprises determining whether a predetermined tone
4 map index is part of the control information.

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1 13. The method of claim 10, wherein the data being
2 encoded is received over at least two communication paths, at
3 least one bit from each of the plurality of blocks is received
4 over a first communication path while the remaining twenty-
5 four input bits of each of a plurality of blocks is received
6 over a second communication path.

1 14. The method of claim 13 further comprising:
2 placing the encoded data within a HomePlug frame; and
3 transmitting the HomePlug frame over the power line via a
4 primary channel.

1 15. The method of claim 14 further comprising:
2 placing the extracted at least one bit into a frame for
3 transmission over the power line via a secondary channel.

1 16. A HomePlug compliant station comprising:
2 a media access control (MAC) layer; and
3 a physical layer in communication with the MAC layer, the
4 physical layer including a Frame Control Forward Error
5 Correction (FEC) encoding logic to encode and interleave both
6 data and control information associated with the frame during
7 a first mode of operation.

1 17. The HomePlug compliant station of claim 16, wherein
2 the physical layer further includes a data FEC encoding logic
3 that, during a second mode of operation, encodes and
4 interleaves the data while the Frame Control FEC encoding
5 logic encodes and interleaves only the control information.

1 18. The HomePlug compliant station of claim 17, wherein
2 the control information includes a tone map index value.

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1 19. The HomePlug compliant station of claim 16, wherein
2 the Frame Control FEC encoding logic (i) determining a mode of
3 operation of the HomePlug compliant station, and (ii) encoding
4 the control information and data in an iterative manner.

1 20. The HomePlug compliant station of claim 16, wherein
2 the Frame Control FEC encoding logic (i) determining a mode of
3 operation of the station, (ii) encoding and interleaving the
4 data to produce a plurality of blocks and the control
5 information to produce frame control symbols, (iii) combining
6 multiple blocks, each being generally equivalent in size to
7 four symbols to produce at least two physical transmission
8 blocks, and (iv) combining the at least two physical
9 transmission blocks, each of the physical transmission blocks
10 being generally equivalent in size to forty symbols, to
11 produce a payload of an outgoing frame.

1 21. A HomePlug compliant station comprising:
2 a receiver to retrieve an incoming frame from a power
3 line; and
4 a Frame Control Forward Error Correction (FEC) decoding
5 logic to de-interleave and decode both data and control
6 information during a first mode of operation.

1 22. The HomePlug compliant station of claim 21 further
2 comprising:
3 a data FEC encoding logic to de-interleave and decode
4 only data associated with the incoming frame while the Frame
5 Control FEC decoding logic de-interleaves and decodes only
6 control information associated with the incoming frame when
7 the station is operating in a second mode of operation.

1 23. The HomePlug compliant station of claim 21, wherein
2 the data is contained within the payload of the incoming
3 frame.

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24. The HomePlug compliant station of claim 23, wherein the Frame Control FEC encoding logic (i) determining a mode of operation associated with a transmitting station, (ii) separating the data of the payload into a plurality of physical transmission blocks, each of the physical transmission blocks being generally equivalent in size to forty symbols, (iii) separating each of the physical transmission blocks into the plurality of blocks, each of the plurality of blocks being equivalent in size to four symbols, and (iv) de-interleaving and decoding the symbols within each of the plurality of blocks by the Frame Control FEC decoding logic to recover the data when the determined mode of operation is the first mode of operation.

1 25. Software embodied in a machine-readable medium and
2 executed by a processor, comprising:
3 a first software module to separate data within a payload
4 of an incoming frame into a plurality of blocks; and
5 a second software module to process both frame control
6 symbols and data within the blocks, the second software module
7 operating as a Frame Control Forward Error Correction (FEC)
8 decoding logic.

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